

Usability Testing of Academic Library Web Sites: A Selective Annotated Bibliography

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ABSTRACT. This is a selective annotated bibliography of books, journal articles, and electronic resources relating to the *usability assessment* or *testing* of the academic library Web site. It focuses on the library Web site specifics, thus answering a librarian's need for one source of information on the available publications. All journal articles have been written by or for academic librarians. This bibliography embraces the issues of usability testing as a process, its goals, objectives, tools, and methodology. The bibliography is grouped by the following topics: background information, tools and methodologies, case studies, dedicated Web sites, and samples of presentations. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com> © 2003 by The Haworth Press, Inc. All rights reserved.]*

KEYWORDS. Web site usability, academic library Web site, usability study, usability testing, usability assessment

INTRODUCTION

The need for a usable and intuitive academic library Web site arose from the fact that the majority of the academic libraries' Web sites were initially designed from librarians' perspectives without any customer-

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centered activities. At the same time, the rapidly expanding online retail market forced large commercial organizations to conduct usability testing of their Web sites in an effort to lure more business by enabling customers to find their products and services intuitively. Information has become as much of a commodity as other products and services. Commercial search engines compete with libraries by offering the student an easy way to find information. In an answer to this, the call has been made for library Web sites that can provide students and faculty with easy access to holdings and services. Following the business model, librarians started to implement extensive user studies applying methods and techniques developed by professional Web designers.

Librarians conducted early studies of academic library Web sites based on the works of the first professional usability experts, such as Jakob Nielsen, Jeffrey Rubin, and Jared M. Spool. Although extremely useful in the general sense, these sources are not library-specific. Recently, there has been an emergence of publications that focus on the usability testing of the academic library Web site. This selective annotated bibliography strictly focuses on materials that describe the usability testing of the academic library Web sites, thus answering a very real need. It strives to cover books, journal articles, electronic resources, and dedicated Web sites that explore the concept of *usability assessment* or *testing* as it relates to the academic library Web site only. It embraces the issues of usability testing as a process, its goals, objectives, tools, and methodology. The bibliography is grouped by the following topics: background information, tools and methodologies, case studies, dedicated Web sites, and samples of presentations. The monographs on the topic and journal articles published in peer reviewed scholarly journals were selected. Few usable Web pages created by the enthusiasts in the field were included. Academic Web sites dedicated to the usability study and samples of the PowerPoint presentations were added. All journal articles have been written by or for academic librarians. Preference was given to the journal articles where the bibliographical and career information of the authors could be found. Only materials published in English during the last five years were selected.

BACKGROUND INFORMATION

Books

Campbell, Nicole, ed. *Usability Assessment of Library-Related Web Sites: Methods & Case Studies*. Chicago: American Library Associa-

tion, 2001. Written especially for academic librarians, this book, compiled of two essays and ten case studies, is intended to help those who are tight on time and budget. Campbell, reference librarian and Webmaster at the Washington State University in Vancouver, shares insights and findings of multiple usability studies that she conducted. In Chapters 1 and 2 she provides basic introduction to the usability testing, defines usability methods, and discusses important elements that should be considered when conducting a test. The remaining chapters include ten case studies of usability tests held by Universities of United States, MIT Libraries, and the National Library of Medicine. They provide practical information on procedures and techniques. Contains bibliographical and carrier information of the contributors, and an extensive list of suggested Web sites and readings.

Covey, Denise Troll. *Usage and Usability Assessment: Library Practices and Concerns*. Washington, D.C.: Digital Library Federation Council on Library and Information Resources, 2002. Although this book addresses the issues related to the digital libraries, it provides basic understanding of methods effective in the evaluation of the usability of academic libraries' online collections and services. The author, an associated university librarian at Carnegie Mellon University, describes tools and methods of usability assessment, explores which methods work better, reveals challenges that librarians face in conducting usability testing. Chapter 2 is dedicated to the theory of user studies: surveys and questionnaires, focus groups, user protocols, heuristic evaluations, and card-sorting tests. Chapter 4 discusses the issues that arise in planning and implementing of a research project. Appendices include two bibliographies, list of participating institutions, survey questions, and a list of measurement tools.

Norlin, Elaina. *Usability Testing for Library Web Sites: A Hands-On Guide*. Chicago: American Library Association, 2002. This handbook is a one-stop guide for those who are just getting into the field of usability and for those who know what usability testing is. It arms librarians with practical information and step-by step guidelines on how to conduct an affordable usability study of the Web site. The first three chapters provide background information on the usability study and outline guidelines for the usable Web site. Chapters 4 and 5 define the process of the study: planning for the test, selecting the Web team, developing the tasks and questions, writing the script, re-

cruiting participants, training testers, and analyzing results. Chapter 6 describes an actual usability study conducted by the Trihard University Library. The book is filled with usable samples, models, templates, and test plans. Includes list of additional readings and index.

Pace, Andrew K. "Optimizing Library Web Services: A Usability Approach." In *Library Technology Reports* 38, no. 2 (March/April 2002): 1-87. This special issue of the journal consists of ten chapters, two extensive appendices, bibliography and cumulative index. It may be identified as a comprehensive reference source for those seeking background information and guidance. Pace walks the reader through the process of usability engineering and testing. The first two chapters are dedicated to the definition of concepts of *usability* and *usability engineering*. The author examines usability goals, methodologies, testing scope, statistical toolbox. In the following chapters the author discusses less formal methods: *usability demonstration* and *usability consensus*. The rest of the book is dedicated to the application of the test results to the various aspects of Web site design, including the use of CSS, XML, frames, animations, and graphics. It also briefly covers the information architecture and the possibilities of optimizing library Web services. Appendices describe a usability test conducted in May 2001 in TechSource College Library and include forms, scripts, and questionnaires used.

Journal Articles

Hammill, Sarah J. "Usability Testing at Florida International University Libraries: What We Learned." *Electronic Journal of Academic and Special Librarianship* 4, no. 1 (2003), <http://southernlibrarianship.icaap.org/content/v04n01/Hammill_s01> (7 July 2003). The article provides basic information for the understanding of the process of usability testing while discussing the concept of *usability* as a component of *usefulness* of the system. It describes the study of the top page of the Florida International University Libraries' Web site launched in 2001. The study was focused on testing three main areas of the Web site: catalog searching, article searching and library services. Theoretical explanations of the concepts and the methodologies are followed by the examination of the quantitative and qualitative data. The author cautions potential testers against "studying the wrong user and having unrealistic tasks."

King, David. "The Mom-and-Pop-Shop Approach to Usability Studies." *Computers in Libraries* 23, no. 1 (January 2003): 12-14, 71-72. This brief work explains to the beginners how to develop and implement the plan for a usability study, and how to get results while spending little or no money. The author compares a library Web site with a store where the shelves are stacked with many varieties and brands of a single product: information. Using this bright comparison throughout the article, King describes how to set the goals for the study, find volunteers, conduct the test, and analyze the results.

Morgan, Eric Lease. "Marketing Through Usability." *Computers in Libraries* 19, no. 8 (September 1999): 52-53. The work provides an overview of the concepts of *usability*, *effectiveness*, *efficiency*, and *satisfaction*, helping beginners to understand the process. Morgan explains that usability addresses the ability of the user to learn the product, experiment with it, and "even re-use it after periods of non-use." He offers guidelines for testing the usability of the academic library systems.

Pace, Andrew. "The Usability Toolbox." *Computers in Libraries* 23, no. 1 (January 2003): 50-52. This is an overview of brief definitions of various usability tools that were described in detail by the same author in "Optimizing Library Web Services: A Usability Approach," *Library Technology Reports* 38, no. 2 (March/April 2002), cited above. The author outlines ten tools: participatory design, the focus group, the user survey, the individual interview, the contextual interview, prototype and walk-through, the card sorting, the usability audit, the field study, and the usability test. Pace draws attention of the audience to what often passes for usability in a library setting, but should be avoided: usability demonstration and usability consensus.

Palmquist, Ruth. "An Overview of Usability for the Study of User's Web-Based Information Retrieval Behavior." *Journal of Education for Library and Information Science* 42, no. 2 (Spring 2001): 123-36. Good source for those who plan to conduct a usability study of the library Web site using special hardware and software. The work provides an in-depth study of the psychological issues related to the user's interaction with the system/interface. Written by a Graduate School of Library and Information Science professor, this article contains descriptive analyses of the terms *usability*, *usability engineering*, and *usability testing*. It examines the ways in which infor-

mation professionals study the user and the user's communication with information retrieval systems. In an extensive literature review the author discusses different approaches to the selections of the participants and methods of usability testing. Palmquist recommends including usability in the LIS curriculum "as a component of either a user-studies course or as an evaluation effort in a Web design course."

Vassiliadis, Kim and Lisa R. Stimatz. "The Instruction Librarian's Role in Creating a Usable Web Site." *Reference Services Review* 30, no. 4 (2002): 338-42. Instructional librarians of the Academic Affairs Library of the University of North Carolina at Chapel Hill examine the role of the instructional services staff in the evaluation of the library Web site. They address the issues of the Web site usability study in a large academic library where a number of departments are involved in the development and maintenance of the Web site. The authors put emphasis on the collaborative nature of the usability studies in a large organization. The article includes description of the test conducted.

Walbridge, Sharon. "Usability Testing and Libraries: The WSU Experience." *ALKI: The Washington Library Association Journal* 16, no. 3 (December 2000): 23-24. A short article offering tips on how to conduct an inexpensive usability study in an academic library environment.

TOOLS AND METHODOLOGY

Card Sorting

Information and Design. *What Is Card Sorting?* 7 May 2003. <<http://www.infodesign.com.au/usabilityresources/design/cardsorting.asp>> (28 July 2003). Professional Web page explaining what is card sorting, when it is appropriate, and how it is conducted.

Heuristic Evaluation

Nielsen, Jakob. *Ten Usability Heuristics*. <http://www.useit.com/papers/heuristic/heuristic_list.html> (22 July 2003). This dedicated Web page lists ten usability heuristics and provides a link to the Web page that describes how to conduct a heuristic evaluation.

Stanford University. "Heuristic Evaluation." *Web-Creators*, 23 March 2001. <<http://www.Stanford.edu/group/web-creators/heuristics.htm>> (1 August 2003). This page provides detailed background information and inspection guidelines. It describes "what" should be evaluated on a Web site, "when" a Web site should be evaluated, "how" and "by whom." It also outlines Jakob Nielsen's "10 Heuristics" and Tognazzini's "First Principals." Links to the related online resources are added at the end of the page.

Formal Usability Testing (User Observation)

Battleson, Brenda, Austin Booth, and Jane Weintrop. "Usability Testing of an Academic Library Web Site: A Case Study." *The Journal of Academic Librarianship* 27, no. 3 (May 2001): 188-98. The authors offer background information on the usability engineering concept and an extensive literature review on the topic. They describe a formal usability study of the University at Buffalo Libraries conducted in 1999. This work goes through all stages of the study, and provides detailed evaluation of the test results.

McMullen, Susan. "Usability Testing in a Library Web Site Redesign Project." *Reference Services Review* 29, no. 1 (2001): 7-22. May be used as a model for the formal usability testing of the academic Web site. The author describes the "observational study" of the Roger Williams University Web site and provides insights to the different stages of the study. The test was based on the suggestions and techniques formulated by Jakob Nielsen, Jared Spool, Keith Instone, and Patrick Lynch. It lasted two years (1999-2000) and embraced: preparation stage, first evaluation, redesigning and heuristic evaluation of the new prototype, second round. Includes a bibliography, extensive appendices with forms, scripts, demographic questions, list of tasks, and appendices with qualitative data analysis.

Focus Groups

Crowley, Gwyneth H., Rob Leffel, Diana Ramirez, Judith L. Hart, and Tommy S. Armstrong II. "User Perception of the Library's Web Pages: A Focus Group Study at Texas A&M University." *Journal of Academic Librarianship* 28, no. 4 (July 2002): 205-11. The authors review the literature on the topic and provide background on the methodology of using focus groups in the usability studies. They discuss the feedback from focus groups and argue that the use of the

focus group protocol is a labor-intensive process that requires a considerable amount of time to implement. The results of the conducted test are illustrated by figures.

Studies Focused on Library Terminology

Benjes, Candice and Janis F. Brown. "Test, Revise, Retest: Usability Testing and Library Web Sites." *Internet Reference Services Quarterly* 5, no. 4 (2001): 37-54. The authors define the role of usability testing comparing Library Web sites with the commercial ones. "User testing requires just three components: a user, a Web site, and an observer." This work describes two consecutive tests conducted during 1998-1999 at the Norris Medical Library at the University of Southern California. Each test was followed by the analysis of the test results and the redesign of the Web site. The first test was preceded by a survey of the original Web site created in 1997. Authors share their insights on the process of the preparation for the test, the test itself, and the process of the implementation of the results into the new Web site design. They highlight that the problem with the library terminology was lessened after the first test and redesign, but it was not eliminated. The article includes figures of the Web site at the different stages of the design, tables with the results analysis, list of bibliography, and appendix with the usability tasks.

Spivey, Mark A. "The Vocabulary of Library Home Pages: An Influence on Diverse and Remote End-Users." *Information Technology and Libraries* 19 (September 2000): 151-56. This study is focused on the language of the library home page. The author argues that previous studies, while paying more attention to the design of the Web site, omitted the fact that the successful navigation depended on the clarity of vocabulary. The article suggests that in the absence of the traditional verbal communication, the patrons may be easily confused by the library jargon used on the academic library Web site. Spivey offers a particularly good examination of the classical and contemporary views of rhetoric and text structures. He conducted an observation of a number of Web sites with the objective of determining how the library jargon could interfere with navigation. The procedures and the results of this observation are discussed in this article.

Kupersmith, John. *Library Terms That Users Understand*, 15 July 2003. <<http://www.jkup.net/terms.html>> (28 July 2003). This Web

site helps librarians to decide what words to use while labeling resources and services on the Web. Provides links to the number of formal usability tests and card sorting exercises conducted by academic libraries. The author discusses the implication of the language studies to the usability testing and suggests "best practices for reducing cognitive barriers caused by terminology." Includes a list of printed and electronic resources.

Studies Focused on the Online Catalogs

Chisman, Janet, Karen Diller, and Sharon Walbridge. "Usability Testing: A Case Study." *College & Research Libraries* 60, no. 6 (1999): 552-69. A plan for the formal usability study of OPAC used by ten libraries of Washington State University was developed and implemented in 1998. In this article authors describe all stages of the test, examine results, and discuss findings related to the budget, test time, and testers' behavior. They emphasize the importance of the intensive screening of the participants. Tables and figures include screening questionnaires, tasks questions, results, and usability checklists.

Feldman, Susan. "The Key to Online Catalogs That Work? Testing: One, Two, Three." *Computers in Libraries* 19, no. 5 (May 1999): 16-20. Feldman explains how librarians should test online catalogs, discusses the significance of the usability testing, gives recommendations on the preparation stage of the test and five following steps. The author agrees on the fact that few representatives are needed in order to find weak spots and reinforce good ideas. The article describes findings about Web searching behavior, and supports the findings with illustrations.

Oulanov, Alexei and Edmund J. Y. Pajarillo. "CUNY+Web: Usability Study of the Web-Based GUI Version of the Bibliographic Database of the City University of New York (CUNY)." *The Electronic Library* 20, no. 6 (2002): 481-7. This is a second article by the authors describing the usability study of the CUNY+ online catalog of books and other materials of 19 libraries found in the City University of New York. The previous article by the same authors, "Usability Evaluation of the City University of New York CUNY+ Database" in *The Electronic Library* 19, no. 2 (2001): 84-91, was dedicated to the usability study of the text version of the catalog. The present article reports on the usability evaluation of the Web version of the catalog.

Ten participants were asked twenty questions and were assigned to respond using a five-point Likert scale. Five criteria were measured: affect, efficiency, control, helpfulness, and adaptability. The authors review related literature and depict analysis of the results. Five tables exemplify the results. In addition, authors explain the use of “applicability” as a Oulanov-Pajarillo tool usability evaluation study (UES).

Alternative Methods

Adams, Mignon and Richard M. Dougherty. “How Useful Is Your Homepage?” *College & Research Libraries News* 64, no. 8 (September 2002): 540-2. A special technique called “RADAR” was used in the usability study of the library’s Web site at the University of the Science at Philadelphia (USP). The “RADAR” process gathers information about the needs of library users and identifies the actions librarians can take in order to meet those needs. The interaction between librarians and users during the “RADAR” process is called “panels.” Authors dispute that the use of surveys in usability study requires considerable time, expertise, and money. They also argue against the use of focus groups based on the fact that those should include faculty and students who are both knowledgeable and willing to participate—which is often difficult. The authors state that “carefully selected panels and well-designed questions . . . can provide invaluable insights as well.” The authors reveal the information generated during panelist and librarian interactions and lessons learned from the experience.

McGillis, Louise and Elaine G. Toms. “Usability of the Academic Library Web Site: Implication for Design.” *College & Research Libraries* 62, no. 4 (July 2001): 355-67. This article is about a usability study of the Memorial University of Newfoundland (MUN) Libraries Web site conducted in February-March 2000. Thirty-three individuals participated in the study. Participants completed three tasks: a background questionnaire, six tasks using the library Web site, and a perception questionnaire at the end of the test. Data were collected in print, and by means of the special data logging software program—WinWhatWhere Investigator. Test administrators were recruited to conduct a test. The authors describe the process of the test and analyze the results task by task. Two figures and four tables illustrate the discussion.

General Case Studies

Allen, Maryellen. "A Case Study of the Usability Testing of the University of South Florida's Virtual Library Interface Design." *Online Information Review* 26, no. 1 (November 2002): 40-53. This is a comprehensive work about usability testing of Web interface of the virtual library conducted in 1999. The author provides short background information on the concept of usability study and describes the research problem. Prior to the study, researchers formed an Interface Design Project Group (IDPG) and developed several new interface designs following the specific guidelines and restrictions outlined in the article. The test process included two stages: "experimental testing" conducted by means of observation, and the "real test" conducted as an "automated mediated test." The author offers an analysis of the advantages and disadvantages of both methods. Prior to the detailed description of the test results, the author portrays the processes of the recruitment of the participants, describes testing environment and test administration. Multiple figures illustrate the description. In the conclusion the author argues for the use of card-sorting methodology in future tests.

Augustine, Susan and Courtney Greene. "Discovering How Students Search a Library Web Site: A Usability Case Study." *College & Research Libraries* 63, no. 4 (July 2002): 354-65. The authors, two reference librarians from the Richard J. Daley Library at the University of Illinois at Chicago (UIC), conducted a usability test of the new Web site launched in summer 2000. The authors reviewed library publications on the topic, coming to the conclusion that the excessive use of library terminology has been cited as a consistent problem in most usability studies. They decided to focus part of their study on "detecting the use of jargon throughout the site." At the first stage of the process, human subject protection approval was received, participants were recruited through an advertisement placed in the student newspaper, a screening survey was conducted, tasks were developed, and a pilot test was accomplished. The authors describe the main process of formal usability testing performed with six participants. The examination of the test results includes extensive description of the qualitative data. Quantitative data are presented in Table 2. Tables 1 and 3 reflect results of the screening survey and tasks questions divided by category. The authors conclude that the study helped to

reveal both specific problems related to UIC library Web site design and students search patterns in general.

Brown, Stephanie Willen. "Test, Edit, Repeat: Steps to Improve Your Web Site." *Computers in Libraries* 22, no. 10 (2002): 12-21. The author, a database services librarian, argues that even a small library could effectively conduct a successful usability study of the Web site. She writes about the process of "moving from early drafts to polish design" and shares insights from the tests of the library Web site implemented at Hampshire College in Amherst, Massachusetts. After the first test of the original site, the author made changes to the design and librarians conducted the second test. More changes to the Web site were made after the second test. The article depicts all stages of the tests and, most importantly, it portrays the description of the changes made to the design after each test. Figures showing the Web site before and after the redesign and a list of task questions illustrate the narration.

Cockrell, Barbara J. and Elaine Anderson Jayne. "How Do I Find an Article? Insights from a Web Usability Study." *The Journal of Academic Librarianship* 28, no. 3 (May 2002): 122-32. In this deep, remarkable research, the authors discuss the background of the usability study and describe the study of the library Web site conducted in Western Michigan University's (WMU) Library in 2000. The literature review attempts to prove the necessity for the study. The problem statement provides clearly outlined goals and objectives of the study. In the first part of the article authors portray the test design and procedure. Multiple tables and figures illustrate the analysis of the results. The authors dispute numerous issues related to the topic: the correlation between the educational level of the participants and their success in navigating the Web site, participants' search behaviors, page layout and library terminology. At the conclusion, the authors offer recommendations for the content and layout. The appendix includes twenty survey questions, and a broad reference list complements the work.

Dickstein, Ruth and Vicki Mills. "Usability Testing at the University of Arizona Library: How to Let the Users in on the Design." *Information Technology and Libraries* 19, no. 3 (2000): 144-51. Five librarians, one system expert, and a graphic artist created a team in 1997 in an effort to conduct usability evaluation of the library Web site and

redesign it according to findings. The project was named ACCESS 2000. Two years later the team was able to create a user-centered information gateway. The article reports on all stages of the study and can serve as a model for other librarians wishing to conduct usability testing in their own institution. The authors outline usability methodologies: heuristic evaluation, card sorting, and formal usability study. They describe the method of recording the test developed during the study. Then the article portrays study findings and how they changed library Web site design. A broad list of references and multiple figures supplement the narration.

Gullikson, Shelley, Ruth Blades, Marc Bragdon, Shelley McKibbon, Marnie Sparling, and Elaine G. Toms. "The Impact of Information Architecture on Academic Web Site Usability." *Electronic Library* 17, no. 5 (October 1999): 293-304. This piece describes the study of the Dalhousie University Web site. To its credit, the article features a discussion on the relationship between academic Web site usability and information architecture. The authors argue that this issue was overlooked in previous publications. During the study, twenty-four faculty members were asked to find the answers to a set of six questions. In addition, participants responded to a survey related to their ability to use the Web site. The results were analyzed from the point of view of user performance, user perception, and user strategies. The thorough discussion of the results is followed by the recommendations for the key ingredients: information design, access tools, and navigation aids. An exhaustive reference list supplements the work. Two appendices include questions used in the study and perception survey.

Travis, Tiffini Anne and Elaina Norlin. "Testing the Competition: Usability of Commercial Information Sites Compared with Academic Library Web Sites." *College & Research Libraries* 63, no. 5 (September 2002): 433-48. This publication compares the usability of the commercial information site, Questia, with the usability of the traditional academic library Web site. The authors criticize library Web sites that were created using "librarians know best model." Their suggestion is to follow the business approach in implementing an extensive user study in the academic library in order to design and maintain user-friendly Web sites. An extensive literature review precedes the description of the actual usability study conducted at the University of Arizona Library. During the study, participants tested four sites:

Questia, University of Arizona Library, California State University-Long Beach, and Blackboard. Numerous tables and figures illustrate findings and analyses of the results. In the broad conclusion the authors discuss the features used by the commercial site that may be adopted by librarians.

DEDICATED ELECTRONIC RESOURCES

Academic Libraries Web Sites

George Washington University. *Web Usability Testing at Gelman Library*, 8 June 2002. <<http://www.gwu.edu/gelman/usability/>> (28 July 2003). Includes PDF files of documents developed for the test and links to different versions of Gelman Home Pages.

Indiana University Bloomington Libraries. *IUB Libraries Web Assessment/Architecture Project*, 6 May 1999. <<http://www.indiana.edu/~libslis/assess/>> (28 July 2003). Contains background documents on the Working Group charges, project schedule, summary, and statistics. Archives documentation of the usability study and information architecture review conducted by two professional consulting firms. Represents an example of the business approach to the topic.

Massachusetts Institute of Technology Libraries Web Advisory Group. *Web Site Redesign*. <<http://macfadden.mit.edu:9500/webgroup/project.html>> (22 July 2003). Provides documentation of usability testing conducted in 1999, includes evaluations of other libraries' Web sites.

University of Arizona. *Access 2000, 1997-1999*. <<http://www.library.arizona.edu/library/teams/access9798>> (22 July 2003). In addition to "Usability Testing at the University of Arizona Library: How to Let the Users in on the Design" by Ruth Dickstein and Vicki Mills, *Information Technology and Libraries* (2000), cited above, this dedicated Web site provides a wide array of information, documentations, and presentations related to the same project: a usability study of the Library Web site conducted in 1997-1999 at the University of Arizona Library. This Web site contains samples of surveys and questionnaires, analysis of the test results, and comments.

University of California, San Diego Libraries. *Usability Testing*, 2001. <<http://libraries.ucsd.edu/about/usability.html>> (28 July 2003). This dedicated Web page documents "how user-centered design was in-

corporated into the development process” of the UCSD Libraries’ Web site. It offers access to the results of the usability study, test documents, papers and presentations, as well as links to useful sites. UCSD Libraries revised its Web site in April 1999, integrating 14 branch library sites into a single information gateway. Links to various prototypes of the home page are provided.

University of Virginia Library. *General Information: Web Usability Testing*, 9 April 2003. <<http://www.lib.virginia.edu/usability/index.html>> (1 August 2003). This is a comprehensive Web site comprised of separate Web pages dedicated to the different aspects of the usability study of the academic library Web site. It offers general information on the importance of the both heuristic and usability testing to library Web sites. It also archives documents of usability tests conducted by the Web usability team in March 2003 and offers links to the related online resources.

University of Washington Library Systems. *Web Usability*, 14 November 2002. <<http://www.lib.washington.edu/Usability/>> (1 August 2003). This dedicated Web site includes guides to planning and conducting usability tests. It archives documents of multiple usability studies conducted in the UW Library and provides links to useful resources. The UW Library conducted separate tests for different navigation links of the Web site, such as “Research Guides,” “FAQ,” and “Borrowing/Delivery.” During the tests participants were asked to find the answers on other libraries Web sites as well. The results of the tests allowed researchers to compare the usability of different academic libraries Web sites.

Presentations

Prown, Sarah. *Detecting “Broke”: Usability Testing of Library Web Sites*, 11 June 1999. <http://www.library.yale.edu/~prowns/nebic/nebic_talk.html> (4 August 2003). A Web presentation by the Librarian for Drama, Film and Media Studies focused on background of usability testing, its methods, and data evaluations. Reports on the tests of the Research Workstation Web site at the Yale University Library.

Tait, Janet. “Usability Testing at the UCSD Libraries.” *Internet Librarian 2001*, 7 November 2001. <http://libraries.ucsd.edu/about/usaweb_files/v3_document.htm> (4 August 2003). This is a useful example of a Microsoft PowerPoint presentation on a usability test.

Useful Internet Resources

Fast, Karl. "Recording Screen Activity During Usability Testing." *Boxes and Arrows*, 19 August 2000. <http://www.boxesandarrows.com/archives/recording_screen_activity_during_usability_testing.php> (29 July 2003). Explains how to perform a visual record of a participant's activities during the test: mouse movements, keystrokes, and others. Gives recommendations on the use of camcorders, VCRs, and appropriate software. Also discusses how to record sound during the test.

Nielsen, Jakob. "Why You Only Need to Test with 5 Users." *Alertbox: Current Issues in Web Usability*, 19 March 2000. <<http://www.useit.com/alertbox/20000319.html>> (15 July 2003). Discusses the correlation between the number of test users and the number of usability problems found. Proves that "after the fifth user, you are wasting your time by observing the same finding."

BOOKS BY PROFESSIONAL USABILITY TESTING EXPERTS

Nielsen, Jakob. *Designing Web Usability: The Practice of Simplicity*. Indianapolis, IN: New Riders Publishing, 2000.

Pearrow, Mark. *Web Site Usability Handbook*. Rockland, MA: Charles River Media, 2000.

Rubin, Jeffrey. *Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests*. New York: John Wiley & Sons, 1994.

Spool, Jared M. *Web Site Usability: A Designer's Guide*. North Andover, MA: User Interface Engineering, 1997.

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